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ENERGY PROJECTS OF THE
GOVERNMENT OF ONTARIO

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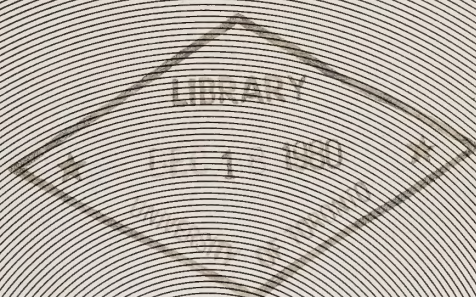
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ENERGY PROJECTS OF THE GOVERNMENT OF ONTARIO 1979/80

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ENERGY PROJECTS OF THE
GOVERNMENT OF ONTARIO
1979/80


Co-ordinated by the Ministry of Energy

The Ontario Government is conducting 250 projects in the energy conservation and renewable energy area in the fiscal year 1979/80.

This digest briefly describes selected projects co-ordinated by the Ministry of Energy and carried out by 14 Ministries of the Government. In addition, many Ministries and Ontario Hydro are conducting a variety of projects independently.

This year \$9.8 million has been allocated to the Energy Conservation and Renewable Energy Programs in the Ministry of Energy. An estimated \$7.2 million is being spent on energy conservation, while \$2.6 million is being spent in the renewable energy field.

October, 1979



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ENERGY PROJECTS 1979/80

ENERGY CONSERVATION

RESIDENTIAL

Attitudes to energy conservation

Improved appliance efficiency	The Ontario Government is working with the Canadian Appliance Manufacturers' Association, Canadian Standards Association, Ontario Hydro and the Canadian Gas Association to encourage use of energy efficient household appliances.
Efficiency of domestic oil furnaces	The Ministry of Energy is working actively with the Ontario Petroleum Association in conducting projects to improve the efficiency of domestic oil furnaces. These projects deal with factors affecting consumer acceptance of this technology.
Residential data base	A number of studies are underway to determine what energy conservation techniques are suitable for various types of residential structures. This research emphasizes apartments. Also being investigated are the factors which motivate people to conserve energy and upgrade the energy conserving features of their homes.

Energy education

Energy curriculum guidelines	The Ministry of Energy supports the development of energy curriculum guidelines by the Ministry of Education for all grades in science, geography and environmental studies. <u>Energy in Society II</u> , the second volume of a publication containing curriculum suggestions, is being prepared for intermediate and senior students.
Teacher development project	Energy matters are being introduced into professional development programs for science, geography and environmental studies teachers.
Teaching and information materials	The Ministry of Energy is developing classroom teaching information materials with the Ministry of Education and Ontario Hydro. Information materials are being developed to answer inquiries from school children, and to aid energy teaching.

Residential conservation technology - retrofit

Upgrading existing housing stock	Problems in upgrading the energy conservation features of existing homes are being identified and evaluated. A Builder's Guide is being prepared in co-operation with the Housing and Urban Development Association of Canada. The accompanying Homebuyer's Guide will form a part of this activity, as does an insulation installer's training course.
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Residential conservation technology - other

Space and water heating appliances	The Ministry of Energy helps to identify and promote ways of improving the energy efficiency of appliances used in the home to heat both space and water. The project is to be conducted in co-operation with fuel suppliers, testing and certification bodies and the Ministry of Consumer and Commercial Relations. This activity will include promotion of a package to make existing oil burners more efficient, and development of certifiable installation procedures for heat pumps.
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Home burner maintenance	Further improvement of skills of certified home burner maintenance mechanics is being carried out through assistance to the Ontario Petroleum Association. The industry's requirements for retraining burner mechanics will be determined, and gas mechanics' skills will be improved.
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Residential conservation projects

Thermography information projects	The Ministry continues to sponsor its "Save Heat" clinics where homeowners can view thermograms (heat pictures) of their houses showing heat loss detected by infrared scanners, discuss their particular problems, and avail themselves of a home energy audit questionnaire. Municipal organizations assist in the delivery of the program. During the fall of 1979, two clinics were held in St. Catharines and Kingston, and two more will be conducted in other communities in the spring of 1980.
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Thermography studies	The Ministry of Energy is monitoring the short and long term effectiveness of the thermography and energy audit techniques in motivating homeowners to conserve energy.
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COMMERCIAL

Public sector space conditioning

Space conditioning (direct)	Energy conservation measures are being implemented in the 35 million square feet of buildings occupied by Ontario Government Ministries. The goal is to reduce energy consumption in government-owned buildings by 15 per cent within five years from 1976/77.
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Space conditioning (indirect)	Working through the appropriate Ministries, the Province is encouraging school boards, hospital boards, universities and colleges etc. to adopt energy conservation measures similar to those now being implemented in Government buildings. The target over a five-year period is to reduce energy consumption voluntarily by at least 15 per cent in buildings funded indirectly by the Ontario Government. Data collection, monitoring and reporting systems are being developed to provide accurate measurement of energy consumption reductions. Thermal performance guidelines and specific energy efficient techniques, including integration of solar energy, are being developed for all new buildings. Results of these efforts are also being applied to other programs aimed at municipal buildings and buildings in downtown Toronto.
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Private sector space conditioning

Energy bus	The highly successful energy bus is being assessed for application in identifying potential savings in energy costs for the commercial sector. The computer-equipped bus is used to perform energy audits on industrial plants. This is part of a series of energy conservation programs which can be expanded to meet the needs of communities.
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Downtown program	An energy conservation program has been developed for privately owned buildings in downtown Toronto. The purpose of this program is to establish a co-operative approach in which business and government work together to conserve energy, demonstrate the results in actual savings and exchange information on energy-saving techniques. By maintaining a working liaison with the executive officers of companies in these buildings, the Government and co-operating private sector firms continue to assess energy consumption, devise individual conservation programs, and monitor the results of the downtown program. Also, the Ministry is providing techniques and advice to other communities interested in establishing similar voluntary programs.
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Municipal program

Energy conservation for municipalities

The Ministry of Energy is developing energy conservation programs to help municipalities achieve energy savings. The program is run through a Joint Steering Committee appointed by the Municipal Liaison Committee of the Association of Counties and Regions of Ontario and the Ministry. More than two hundred municipalities have appointed energy conservation co-ordinators. A major feature of the municipal program is the resource manual which contains case studies and guidelines covering the identified program areas. The manuals are distributed to municipalities who have appointed co-ordinators. Other projects include a bulletin dealing with municipal activities, an updated list of provincial initiatives, provision of technical advice and assistance, organization of seminars, complementary films for distribution to areas not covered by the seminars, and development of a technical base for printed materials. The program will deal with energy conservation in buildings, transportation, building codes, property standards, community planning, street lighting, and waste recovery.

INDUSTRIAL

Industrial cogeneration

The province's potential for industrial cogeneration -- the simultaneous generation of electricity and useful thermal energy (usually steam) -- will be determined and initial development will be carried out with Ontario Hydro. The government will provide technical assistance and advice in assessing the areas in industry where it is practical to use waste heat from manufacturing processes to produce electrical energy.

TRANSPORTATION

Improving efficiency of transportation technology

Auto fuel economy (retrofit)

The Ministries of Energy and Transportation and Communications have been assessing devices which promise to improve the fuel economy of existing cars. Lubricants, tires and cold weather devices are some of the areas to be studied.

Vehicle maintenance

The fuel saving potential of various vehicle maintenance actions are being identified.

Improving efficiency of transportation operations

Trucksave	A joint government/industry advisory group has been formed to guide research and demonstration in truck fuel economy, operations and the movement of urban goods.
Inter-city transportation	Ways of conserving energy in inter-city transportation will be identified.
Fuel efficient auto incentives	A variety of measures for encouraging consumers to buy fuel efficient cars are being investigated in a feasibility study conducted by the Ministries of Energy and Transportation and Communications.
Reduced vehicle speeds	The energy saving potential of reduced vehicle speeds has been identified and major options developed.
Driver performance improvement	Since driving habits can play a large role in improving car mileage, a program to improve driving performance is being prepared. Driver education improvement, public awareness, and driver performance testing are all part of this activity.
Municipal transportation program	A municipal energy conservation program to develop transportation strategies is being implemented.

Using more efficient modes

Car and van pooling	Demonstrations showing the potential of car and van pooling continue.
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Developing alternatives to oil

Alternative fuels	Electric vehicles and buses, and use of propane, natural gas or methanol are some of the alternatives being examined as part of a program to assess and test alternative fuels.
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Reducing the need for travel

Teleconferencing	The Ontario Government plans to use telecommunications to reduce the need for inter-city travel in its own operations, and to demonstrate the effect of this practice in reducing energy consumption.
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URBAN DEVELOPMENT

Development of energy efficient technology

District heating	District heating may be demonstrated in the residential St. Lawrence area of Toronto and district heating concepts will be communicated to municipalities. A policy discussion paper will be prepared.
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Community design

Planning tools for municipalities	Energy planning tools are being developed for use by municipalities. Estimation of local energy and power requirements, estimation of capital costs, and shading and landscaping are aspects being considered.
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Residential development	Energy conservation opportunities in residential development are being identified and analyzed. A computer model has been developed to analyze energy implications of site design. Passive solar gain and subdivision design are being investigated.
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Urban redevelopment	Energy conservation opportunities in urban redevelopment will be examined in several downtown areas.
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Commercial/residential development	Energy conservation opportunities in large scale commercial/residential developments such as the Mississauga City Centre will be demonstrated.
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Energy planning

Energy planning concepts	Seminars and resource packages will communicate energy planning concepts to municipalities and professional communities.
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Energy planning guidelines	Guidelines for energy planning are being developed by the Ministry. These include: preparation and packaging of information for municipalities; advice on subdivision designs; liaison with municipal planning staffs; energy budgets for commercial and residential development; feasibility of energy impact assessment; assessment of the transferability of U.S. municipal management experience to Ontario; internal review guidelines for official plans; and municipal guidelines.
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FISCAL, LEGAL AND PROGRAM POLICY

Bilateral agreement	The Federal/Provincial bilateral agreement on energy conservation and renewable energy is being established, and an implementation plan developed.
Encouraging conservation	The Ministry of Energy will examine methods of encouraging energy conservation through fiscal, legal and program policies. Lifecycle costing guidelines will be studied.
Research and development	Working in conjunction with the Ontario Research Foundation and universities as appropriate, the Ministry of Energy will develop basic knowledge in promising areas of energy conservation not covered by existing federal government programs.

RENEWABLE ENERGY

PROGRAM PLANNING

Inventory of resources

Inventory of resources	A data inventory of Ontario's renewable energy resources will serve as a vital tool for program planners, decision makers and system designers. In the solar area, the Ministry will ensure that radiation data are compiled. The inventory in the energy from waste/biomass area will include a survey of forest products industries, a review of municipal waste quantities, and a study of wood space heating costs. In the remote power systems area, wind frequency data will be compiled.
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New areas

Identification of new areas	The province plans to identify new areas of renewable energy technology requiring provincial involvement. Efforts in this area will focus on research and development leading to product improvement, and new applications and technology. Photovoltaic devices, which convert solar energy directly to electricity, will be reviewed. Thermosyphon water heaters are being assessed to determine their application to Ontario, particularly to the cottage area. Studies dealing with energy plantations, where trees are grown for their energy value, will be done in the Energy from Waste/Biomass area.
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Strategy Development

Commercialization strategies	Strategies to help the private sector commercialize renewable energy resources over the next ten years are being developed. Also, a market study of energy from waste/biomass will be carried out.
Energy from waste strategy	An energy from waste strategy is being implemented. Development of an implementation plan, evaluation criteria for financial analysis and cost benefit techniques are parts of this activity.

Bilateral agreement	Projects are being initiated under the Canada/Ontario bilateral agreement for conservation and renewable energy development and demonstration.
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Economic analysis

Market for solar	The Ministry is looking at the requirements for solar energy and renewable energy systems, and will compare the costs of the solar systems with those of conventional energy sources (oil, natural gas and electricity). This research will form a basis for development strategies to commercialize solar energy and renewable energy systems.
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Solar monitoring

Dissemination of information	Standard procedures for instruments, monitoring, and reporting and assessing results are being developed for solar installations. This will enable the Ministry to disseminate meaningful and consistent information on solar energy with minimal time delay.
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Standards

Standards and testing methods	An ongoing feature of the renewable energy program is the development and upgrading of standards and testing methods for solar energy and wood burning equipment. The Ministry is participating in the Canadian Standards Association's standard writing procedure for solar equipment, and is monitoring various institutes and associations in the Energy from Waste/Biomass area.
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Institutional factors

Factors affecting acceptance of renewable energy	Further review and assessment is to be carried out regarding factors which affect acceptance of renewable energy. Building codes, shading and windows will be examined in the solar area, while institutional factors will form the focus of efforts in the Energy from Waste/Biomass area.
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Technology acceptance

Committee participation	The Ministry of Energy participates on committees to encourage the development and acceptance in the marketplace of renewable energy technology. In the solar area, these committees include the National Research Council Associate Committee, Humber College Advisory Committee, Kortright Centre Energy Advisory Group, and CMHC Steering Group advising on a solar mini-utility.
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RESIDENTIAL

Solar design development

Optimization of design	Results of earlier demonstration projects are being used to help optimize designs of generic passive and active solar energy systems for residential use.
Preliminary guidelines	Preliminary guidelines in the renewable energy area are being developed for consumers, builders and designers. These will provide a source of reliable information for purchasers and installers. In the solar area, tables and graphs are being developed to help in the design of passive solar heating systems for the Ontario climate. A builders guide to energy conservation and solar utilization in new residential housing construction is being prepared in conjunction with the Housing and Urban Development Association of Canada. And other preliminary guidelines will deal with solar swimming pool heating.

Solar equipment evaluation

Package solar hot water systems	Domestic hot water (DHW) systems will be evaluated at Ontario Hydro laboratories in order to assist the industry in developing reliable products and to provide input to the Canadian Standards Association's standard writing procedure.
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Specific solar designs

Design, demonstration and monitoring	Solar energy systems in the residential sector will be designed, demonstrated and monitored for specific sites. Designs for a domestic hot water (DHW) system for apartment buildings are being developed, and a report prepared on a previously designed solar heating system for row housing. Demonstrations will be carried out for solar DHW in a low rise apartment building. The Aylmer Senior Citizens' home, Canada's first solar heated apartment building, is being monitored and assessed, as is Provident House, one of Canada's first solar heating demonstration projects. Monitoring and assessment is also being done for four DHW systems installed in 1978/79, and a package space heating system.
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Alternatives to diesel electric

Investigation and feasibility studies	Alternatives to diesel generation for electric power supply will be investigated, and feasibility studies carried out. Wood gasifier engines are one option which will be studied.
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COMMERCIAL

Specific new solar designs

Systems for service hot water	Design, installation, commissioning and monitoring of solar energy systems for service hot water is a major part of the Ontario Government program in the commercial sector. Demonstrations are being carried out at the Ontario Correctional Institute (OCI) in Brampton, Confederation College in Thunder Bay, and Oakville Trafalgar Hospital. All the demonstration projects will be monitored.
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Assessment of installations

Solar assessment and reporting	Assessment, reporting and modification if necessary will be carried out for solar demonstrations commissioned in 1978/79. One of the projects under study is Applewood Public School in St. Catharines, Canada's first solar heated school. Other installations include the Newmarket Court House, Sudbury Civic Centre, Centralia College, and the Richvale Community Centre swimming pool in Richmond Hill.
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Wood heating

Wood chips for public sector heating

Feasibility studies and demonstration of using wood chips for public sector heating will be carried out. Testing of equipment will be conducted on both a domestic and industrial scale. Projects, using the wood-steam-heat conversion concept, will include a hospital, recreation centre and other public sector buildings.

INDUSTRIAL

Continued study of competitive equipment and systems

Liaison will be maintained with the Canadian Solar Industries Association. In the remote power systems area, the 50-kilowatt wind diesel hybrid will be tested in the Sudbury area. Also, the Ministry is in the process of selecting a site for a small scale wood gasification pilot plant.

Industrial development

Solar energy for process heat

A feasibility study is being conducted to identify the potential uses of solar energy to produce low and medium temperature process heat. Industrial heat needs are being categorized as to temperature requirements, and the solar energy systems which have the potential of meeting these needs will be identified. Another project, which deals with a Ministry of Transportation and Communications (MTC) patrol garage, is studying the feasibility of providing a portion of the space heating requirements. The study deals with both the addition of energy conserving measures to the existing building design and with the conceptual design of a new energy conserving building to suit MTC requirements. There are over 300 patrol garages for snow ploughs in Ontario.

Major energy from waste projects

Feasibility and design studies	Feasibility and design studies are being carried out for major energy from waste projects. These include the Toronto District Heating Incinerator, Commissioners Street Heat Recovery, Nordfibre in North Bay, a small scale municipal incinerator, digester gas utilization, Reed Paper project in Peel, Ontario Paper project in Niagara, SWARU, Tricil's cogeneration project, Inco/Intermetco in the Toronto area and Sudbury, General Motors project in St. Catharines, co-ordination of Shell/Woodex project in Hearst, and the Toronto sludge project.
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Agricultural uses

Assessment of potential	The potential for using renewable energy in agriculture continues to be assessed. In the solar area, grain drying and barn and heating demonstrations will receive particular attention. And in the energy from waste/biomass area, the Arkell biogas digester will be assessed.
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Research and development

New concepts and technology	New concepts and technology will be developed with specific application to Ontario. In particular, research and development in solar conversion technology will be carried out. And, continuing work in the biomass conversion area will include: gasification of wood, production of liquid fuel from wood; and production of methane gas from animal wastes.
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'Gasohol'	In line with the recommendations of an Advisory Group on Synthetic Liquid Fuels, the Ontario Government is evaluating the use of alcohol and other alternatives to gasoline. Both ethanol produced from grain and methanol from wood can be combined with gasoline to form gasohol. The Ministry is also conducting research and development on synthetic fuel systems supplied with biomass raw materials.
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COMMUNICATIONS PROJECTS

GENERAL PROGRAM

Expansion of information facility	Information services will be expanded by developing mechanisms for information retrieval, access and dissemination. Technical report guidelines, assessment of audio-visual and exhibit projects, and information co-ordination under the Federal/Provincial Bilateral Agreement are activities in this area. A package dealing with energy information sources is also being prepared.
Expanded media relations	This year, media relations activity has been expanded to include advertising for case studies of Ontario Government buildings.
All-Ministry activities	The Communications Group provides input into activities involving the whole Ministry, such as the annual report, estimates, Throne Speech etc.
Visual identity system	A visual identity system has been approved for publications, display and audio visual material to provide a uniform look for the Ministry of Energy.
Employee awareness program	The Communications Group is planning and developing an "in house" employee conservation awareness program.
Inter-ministerial working group	An inter-ministerial working group is being formed to co-ordinate communications activities related to the Government's energy management program. This project will include planning and development of an inter-ministry communication co-ordination mechanism to produce a project description summary, publications list, and government resource guide.
Co-ordination with Ontario Hydro	The Communications Group co-ordinates energy conservation communications activities (including educational activities) with Ontario Hydro.
Communication with homeowners/householders	The development of ways to reach homeowners and householders continues. Specific projects include a series of pamphlets and an energy exhibit.

CONSERVATION

Municipal program	A resource manual in support of the Ministry's municipal program has been produced. It contains general information on existing programs and practical information on various aspects of energy conservation in municipalities.
Downtown program	Resource materials are being developed for the Ministry program aimed at downtown Toronto building owners. A State of the Skyline Report documented progress in dimming night lighting in the downtown area, and a seminar was held.
Transportation and urban planning	Publications and other resource material are being prepared to communicate developments in transportation and urban planning. Technical reports and/or booklets will deal with specific projects. Other publications will deal with district heating and passive solar design. Seminars and a handbook aimed at planners are additional communications projects.
Technical information for homeowners	Technical reports and/or booklets will be prepared, and advertising and exhibits for the thermography program will also be carried out.
Information for farmers	The Ministry provides information to farmers on efficient ways of using energy in all farm operations.

RENEWABLE ENERGY

Information on demonstration projects	Technical and renewable energy information is being prepared using data obtained from demonstration projects. Technical reports and/or booklets will be prepared in the solar and biomass areas. Topics include passive solar design, solar swimming pool heating, and solar domestic hot water heating.
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Semi-technical
and lay audiences

Publications and other materials geared to semi-technical and lay audiences are being developed. Projects include case studies dealing with solar projects, pamphlets, and booklets dealing with wood energy, wind energy and energy from waste. In addition, slides and photos will be used to document certain projects.

Long term items

Long term items include a booklet called "Doing Something About Energy"; development and implementation of an energy newsletter; mini-films; fact sheets; a solar film; a heat pump pamphlet; a home buyer's guide; a renewables overview film; a newspaper for school age children; and a booklet on passive solar heating. The commitment to Small Times newspaper has been completed.

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